SURVEY OF ACARINE FAUNA IN DUST SAMPLINGS OF CURTAINS IN THE CITY OF CAMPINAS, BRAZIL

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(With 1 figure)

ABSTRACT

The aim of this study was to investigate the mite fauna present in 33 living room and 22 bedroom curtain dust samples from 41 different homes in the southern Brazilian city of Campinas, SP. A total of 148 mite bodies were found. Of these, 83 were found in living-room curtain samples (56.1% of total) and 65 were in bedroom curtain dust samples (43.9%). The most frequently observed mite suborders were: Acaridida (n = 79; 53.4%), Actinedida (n = 53; 35.8%), Oribatida (n = 14; 9.5%), and Gamasida (n = 2; 1.3%). The most frequent families were Pyroglyphidae (n = 61; 41.2%), Eriophyidae (n = 25; 16.9%), Tarsonemidae (n = 15; 10.1%), and Glycyphagidae (n = 13; 8.8%). No statistical difference was observed between the number of mites found in the samples from living room and bedroom curtains.

Key words: house dust mites, Pyroglyphidae, Eriophyidae, Oribatida.

RESUMO

Fauna acarina em amostras de poeira de cortinas

O intuito deste estudo foi avaliar as espécies acarinas encontradas em amostras de poeira de cortinas presentes em 33 salas e 22 quartos de um total de 41 domicílios na cidade de Campinas, SP. Foram encontrados 148 ácaros. Desse total, 83 foram encontrados na sala de TV (56,1% do total) e 65 nos quartos (43,9%). As principais subordens encontradas foram: Acaridida (n = 79; 53.4%), Actinedida (n = 53; 35.8%), Oribatida (n = 14; 9.5%) e Gamasida (n = 2; 1.3%). As principais famílias observadas foram: Pyroglyphidae (n = 61; 41,2% do total), Eriophyidae (n = 25; 16,9%), Tarsonemidae (n = 15; 10,1%) e Glycyphagidae (n = 13; 8,8%). Não houve diferença significativa no número de ácaros observados nas amostras da sala e do quarto.

Palavras-chave: ácaro, poeira domiciliar, Pyroglyphidae, Eriophyidae, Oribatida.

INTRODUCTION

In Brazil, among other countries, housedust mites have been collected from many different indoor sources, mainly mattresses, pillows, rugs, and sofas (van Bronswijk, 1981; Binotti *et al*., 2001). However, few studies exist on other mite sources in Brazilian homes (Binotti *et al*., 2001). We have therefore investigated and taxonomically classified mite species observed on curtain-dust samples from dwellings in the southern Brazilian city of Campinas, São Paulo State.

MATERIAL AND METHODS

Bedroom (n = 22) and living room (n = 33) window curtains in houses and apartments (n = 41) were used, based on consent of invited volunteers. Curtain-dust samples were collected once between February 1996 and June 1997. The collection method was similar to that described by Smith *et al.* (1985). The curtain surface in each room was cleaned for 2 min. (covering approximately 2 m^2) with a 1.000 W vacuum cleaner (Electrolux®, Guarulhos, Brazil). A piece of linen cambric (10 x 10 cm) held over the distal opening of the suction hose into the cleaning nozzle trapped the aspirated dust. Using a 500 μm-mesh sieve, the larger particles in each dust sample were removed. A pinch of the fine dust was then mounted in Hoyer's medium, prior to identifying the larvae, nymphs, and adults (body count).

Mites were identified under a light microscope using the classifications proposed by Krantz (1978), and Colloff & Spieksma (1992). A non-parametric method (Mann-Whitney test) was applied to compare the differences in mite counts. Analysis of variance was also performed to compare the curtain material as well as the influence on mite number of domestic animals (cats and/or dogs) living in each residence. The Fisher LSD method was used to analyze specified linear combinations. Significance level was 5%.

RESULTS

Mite bodies (larvae, nymphs, and/or adults) were found on 41 (74.5%) of total samples (n = 55). A total of 148 mites were observed [mean ± CI95%: 2.7 ± 1.0 mites per microscope slide (m/ms); range: from 1 to 15 m/ms]. Of this total, 83 mites were found on dust samples from living room curtains (56.1% of total), and 65 mites from those in bedrooms (43.9%). No statistical difference was observed in mite number between bedroom and living-room dust samples. The most observed mite families were: Pyroglyphidae (n = 61; 41.2% of total), Eriophyidae (n = 25; 16.9%), Tarsonemidae (n = 15; 10.1%), and Glycyphagidae (n = 13; 8.8%). Mites of the suborder Oribatida were also present but could not be fully identified (n = 14; 9.4%) (Table 1; Fig. 1).

Most prevalent mite families on dust samples from living-room curtains were Pyroglyphidae (n = 25; 30.1%), the mite *Dermatophagoides pteronyssinus* being the most observed, and Eriophyidae (n = 20; 24.1%). Furthermore, on bedroom-curtain dust samples the most frequently observed families were Pyroglyphidae (n = 36; 55.4%), the mite *D. pteronyssinus* again being the most frequently encountered, and Glycyphagidae (n = 9; 13.8%). The family Eriophyidae was the third most prevalent family on curtain-dust samples from bedrooms. Furthermore, a total of 28 eggs were found (14 from each source; $p > 0.05$).

An analysis of curtain types (closed fabric, lace, Persian blinds, panels, and others) and the number of mite bodies observed on each was performed. No statistical difference was observed but a significantly higher number of mite bodies were found on Persian blinds when compared to the other curtain types ($p < 0.05$). In addition, a significantly higher number of mite bodies were obtained for samples from dwellings in which an animal (cat or dog) was present ($p < 0.05$). No statistical difference was observed for types of dwellings (houses or apartments) and mite number. Other variables such the number of animals, domestic habits among the volunteers, and curtain-cleaning frequency were not analyzed.

DISCUSSION

The acarine fauna found on dust samples from living and bedroom curtains from dwellings in Campinas presents only partially correlated with mite species present on dust from many other indoor sources (Rosa & Flechtmann, 1979; Binotti *et al.*, 2001). There was an increase in the number of mite species seldom observed in housedust samples such as the phytophagous mite Eriophyidae and ground mites of the Oribatida suborder. While we were not able to fully identify these mites, their presence on curtains strongly suggests contamination by wind and should be more carefully studied.

No statistical difference was observed between houses or apartments and mite number. External, high wind-driven contamination could partly explain the similar pattern observed in both house and apartment samples.

A significantly higher mite body count was observed on dust samples from dwellings in which a pet (dog or cat) was referred to as frequently being indoors. This fact was not studied in greater detail but we believe it could be directly related to curtain contamination, or to increase in animal dander on curtain surfaces, which could then feed many mite

specimens. However, these suppositions were not investigated.

There have been no previous analyses of mite fauna on curtain-dust samples in Brazil (Binotti *et al*., 2001). Furthermore, detailed international-source searches for medical and biological references showed no previous studies restricted to mite specimens on curtain-dust samples. However, some studies have analyzed mite allergen concentration (*Dermatophagoides* sp.) on dust samples from many different sources (including curtains) from schools and day nurseries (Munir *et al.*, 1995; Berge, 1998). These studies, while only quantifying *Dermatophagoides* allergen concentrations, showed that school and day-nursery curtains were not intensively infested by these mites. The present data also suggest that dust samples from curtains were not intensively infested by mites.

TABLE 1
Total number of mite bodies on dust samples from living room (n = 33) and bedroom (n = 22) curtains of 41 dwellings in Campinas, Brazil.

FAMILIES	Living room		Bedroom		Total	
	N	%	N	%	N	%
Suborder Acaridida	33	39.8	46	70.8	79	53.4
Family Pyroglyphidae	25	30.1	36	55.4	61	41.2
Larvae	7	8.4	5	7.7	12	8.1
Dermatophagoides sp. – nymphs	12	14.5	19	29.3	31	20.9
D. pteronyssinus	5	6.0	8	12.3	13	8.8
D. farinae	–	–	1	1.5	1	0.7
E. maynei	1	1.2	2	3.1	3	2.0
P. africanus	–	–	1	1.5	1	0.7
Family Glycyphagidae	4	4.8	9	13.8	13	8.8
Larvae	1	1.2	3	4.6	4	2.7
B. tropicalis	3	3.6	6	9.2	9	6.1
Family Acaridae	4	4.8	1	1.5	5	3.4
Larvae	–	–	1	1.5	1	0.7
T. putrescentiae	4	4.8	–	–	4	2.7
Suborder Actinedida	38	45.8	15	23.1	53	35.8
Family Eriophyidae	20	24.1	5	7.7	25	16.9
Family Tarsonemidae	11	13.2	4	6.2	15	10.1
Family Cheyletidae	1	1.2	5	7.7	6	4.0
Family Pyemotidae	5	6.0	–	–	5	3.4
Family Demodicidae	–	–	1	1.5	1	0.7
Family Unknown	1	1.2	–	–	1	0.7
Suborder Oribatida	11	13.2	3	4.6	14	9.5
Family Unknown	11	13.2	3	4.6	14	9.5
Suborder Gamasida	1	1.2	1	1.5	2	1.3
Superfamily Uropodoidea	1	1.2	–	–	1	0.7
Family Unknown	–	–	1	1.5	1	0.7
Total number of eggs	14	100.0	14	100.0	28	100.0
Total number of mites	83	100.0	65	100.0	148	100.0

Samples were collected between February 1996 and June 1997. **N** – number of mites; **%** – percentage.

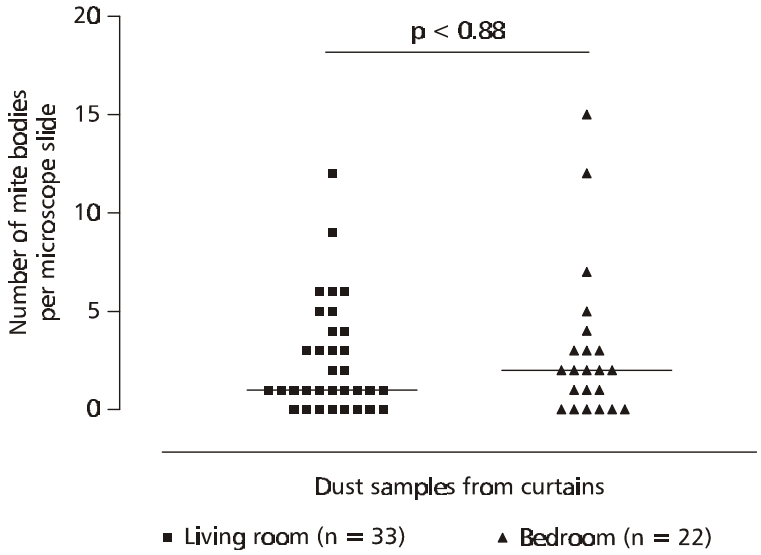

Fig. 1 — Number of mite bodies observed on dust samples from living room (n = 33) and bedroom (n = 22) curtains of 41 dwellings in Campinas, Brazil. Total number of mite bodies on dust samples of living room (n = 33) and bedroom (n = 22) curtains of 41 dwellings in Campinas, Brazil. Samples were collected between February 1996 and June 1997. Horizontal bars represent respective median values.

Finally, very little information exists regarding the presence of Eriophyidae and Oribatida mites on indoor dust samples or even their possible relation to human allergy (Binotti *et al*., 2001). The presence of these mites requires more attention in future studies.

In conclusion, the present study confirms indoor curtains as possible sources of mites. Much care should be taken to avoid dust buildup on curtains. Furthermore, allergic individuals should avoid the use of Persian blinds and keep pets outdoors.

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